

Congestion Management Systems: A Federal Perspective

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7 Key CMS Components



1. Area of Application



2. System Definition

(modes & network)



3. Performance Measures

4. Performance Monitoring Plan



5. Identification & Evaluation of Strategies



6. Monitoring Strategy Effectiveness



7. Implementation & Management

Key Federal Requirement

- **Non-attainment TMAs (ozone and/or CO):**
 - **All reasonable, multi-modal TDM/OSM strategies analyzed in corridor where capacity increase is proposed**
 - **If analysis demonstrates these strategies cannot satisfy need for additional capacity, CMS shall identify all reasonable strategies to manage SOV facility effectively**

Large MPOs

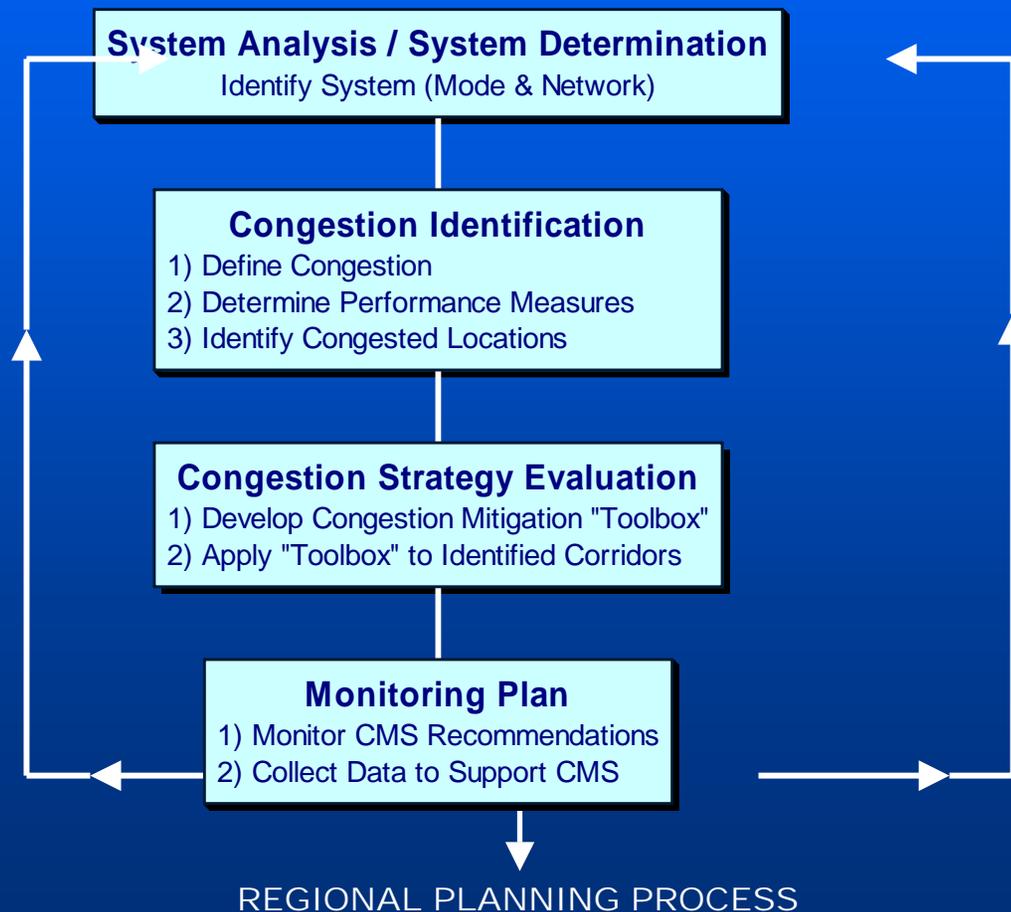
North Jersey MPO Example

- CMS Performance Goals
- Strategy Analysis
 - Examination of CMS-related projects
 - Prioritization of new strategies and projects for the Regional Transportation Plan
 - Identification of new strategies and projects for implementation by appropriate agencies

LOCALIZED PERFORMANCE GOALS

CATEGORY	MEASURES
1. ACCESSIBILITY	Accessibility by Roadway, Transit to Jobs, Labor
2. RELIABILITY	Incident Delay
3. SUSTAINABILITY	VMT per capita
4. INTERMODALITY	Non-SOV Mode Share Transit % Households
5. HIGHWAY MOBILITY	Highway Delay Congestion
6. TRANSIT MOBILITY	Transit Time Ratio One Passenger Miles at Critical Locations Over Capacity
7. WALK/BIKE MOBILITY	Pedestrian Compatibility Index Bicycle Compatibility Index
8. FREIGHT MOBILITY	Intermodal Facility Congested Access Truck Congestion Indicator

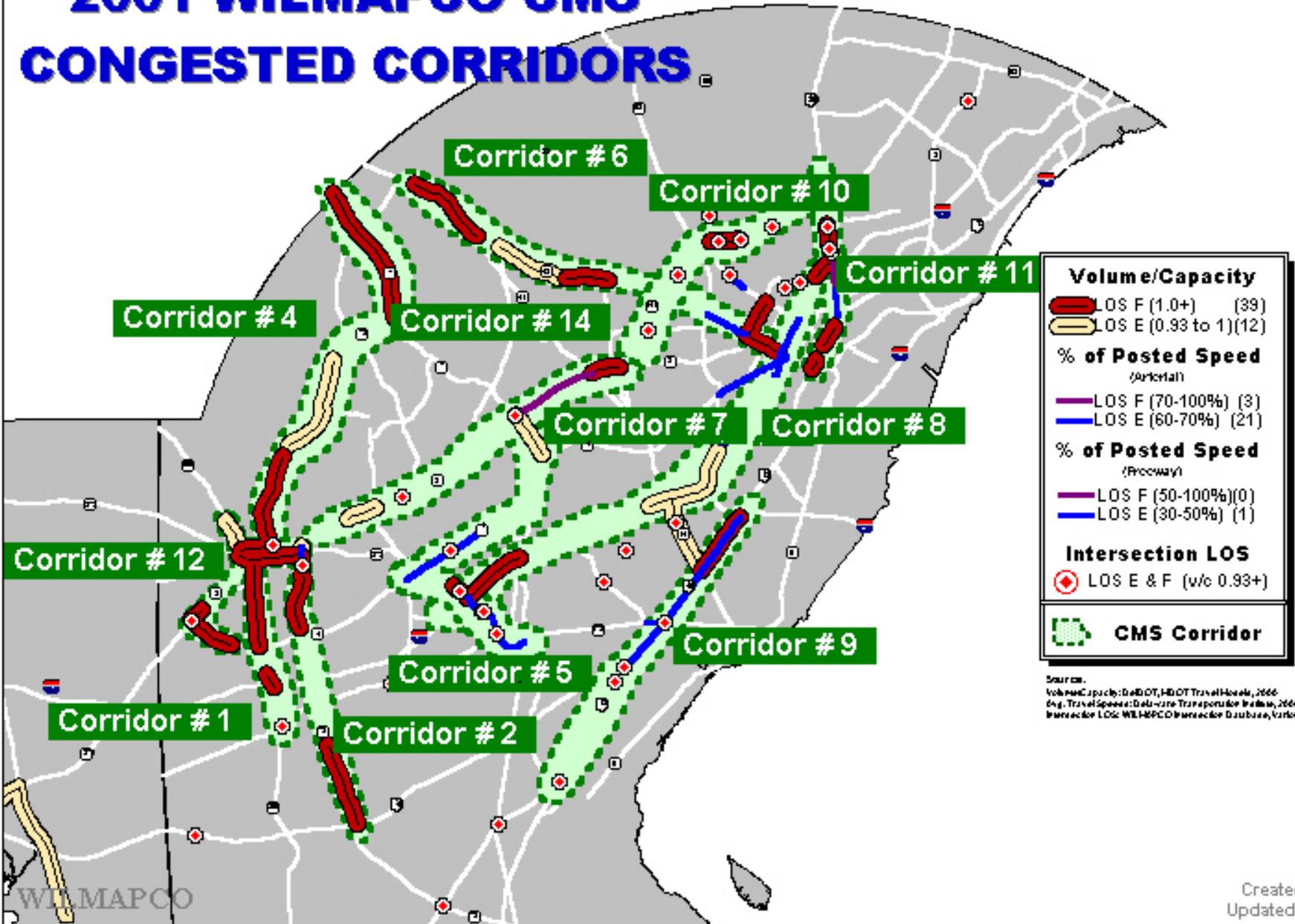
Mid Sized MPOs Wilmington DE CMS Process - Overview



Performance Measures

1. Roadway Volume/Capacity Ratio
2. Intersection Level of Service
3. Percent Under Posted Speed
4. Transit Level of Service

2001 WILMAPCO CMS CONGESTED CORRIDORS



Source:
 Volume/Capacity: DelDOT, HDOT Travel Models, 2000
 Avg. Travel Speeds: DelDOT Transportation Planning, 2000
 Intersection LOS: WILMAPCO Intersecter Database, Various Sources, 2001

CMS Process – Step 3

Congestion Strategy Evaluation

The “Toolbox” of Strategies

Strategy #1: Eliminate person trips or reduce VMT during peak hours (Land Use, Congestion Pricing, TDM)

Strategy #2: Shift Trips from Automobile to Other Modes (Transit, Bicycle and Pedestrian Improvements)

Strategy #3: Shift Trips from SOV to HOV Auto/Van (Rideshare, HOV Facilities, Parking Management)

Strategy #4: Improve Roadway Operations (Arterial and Freeway Operations, Access Management)

Strategy #5: Add Capacity

CMS Process – Step 3

Congestion Strategy Evaluation

			Pass Screening? (See Appendix for Details)
Strategy #1: Eliminate Person Trips or Reduce VMT During Peak Hour	Growth Management/Activity Centers		
	1-1	Land Use Policies/Regulations	<input checked="" type="checkbox"/>
	Congestion Pricing		
	1-2	Road User Fees	
	1-3	Parking Fees	
	Transportation Demand Management		
	1-4	Telecommuting	<input checked="" type="checkbox"/>
	1-5	Encourage Employer Flextime Benefits	<input checked="" type="checkbox"/>
Strategy #2: Shift Trips from Automobile to Other Modes	Public Transit <i>Capital</i> Improvements		
	2-1	Exclusive Right of Way -- New Rail Service	
	2-2	Exclusive Right of Way -- Busways, Bus Only Lanes, and Bus Bypass Ramps	
	2-3	Fleet Expansion	
	2-4	Improved Intermodal Connections	
	2-5	Improved/Increased Park-n-Ride Facilities	
	Public Transit <i>Operational</i> Improvements		
	2-6	Service Expansion	
	2-7	Traffic Signal Preemption	<input checked="" type="checkbox"/>
	2-8	Fare Reductions/Reduced Rate of Fare Increase	
	2-9	Transit Information Systems	
	Advanced Public Transportation Systems (APTS)		
	2-10	Intelligent Bus Stops	
Bicycle and Pedestrian Modes			
2-11	Improved/Expanded Bicycle Network		
2-12	Bicycle Storage Systems		
2-13	Improved/Expanded Pedestrian Network		

Linkages from CMS to Project Selection

Atlanta's Prioritization of Corridors for Study

Table 6-13: CMS Criteria and Priority Measures by Weight.

Criteria	Priority Measure	Points	Weight (%)
Congestion (78 pts / 59%)	o Average duration	20	15
	o Maximum duration	20	15
	o Capacity	30	22
	o Functional classification	8	6
	o Congested transit links	2	1
Goods Movement (8 pts / 5%)	o Heavy truck volume	6	4
	o Active freight rail	2	1
Connectivity (12 pts / 9%)	o Activity centers connected	6	5
	o LCIs connected*	3	2
	o Intermodal facilities connected	3	2
Transit (12 pts / 9%)	o Type of service	3	2
	o Quality of service	3	2
	o Mode share (HBW Trips)	6	5

Atlanta's Prioritization of Corridors for Study

Safety** (0 pts / 0%)	o Higher than average number of injury accidents per VMT	0	0
	o Higher than average number of fatality accidents per VMT	0	0
Environmental Justice (12 pts / 9%)	o Elderly population	3	2
	o Low income population	3	2
	o Minority population	6	5
Pipeline (-12 pts / 9%)	o Projects in the TIP	-8	7
	o Projects in the RTP	-3	2
	o Projects currently under study	-1	1

Durham TIP Priorities

To include CMS Projects within TIP Priorities each segment ranked is as follows:

$$\text{Rank} = \text{ELOS} + \text{FLOS} + \text{TV}$$

Where:

$$\text{ELOS} = \text{severity of existing congestion (Existing volume/capacity)} * 70\%$$

$$\text{FLOS} = \text{projected level of congestion with no improvements (Projected 2025 volume/capacity)} * 20\%$$

$$\text{TV} = \# \text{ travelers affected - Total existing volume (score between 0 and 10)}$$

Score Road AADT

0 = Less than - 7,999, 2.5 = 8,000 - 14,999, 5.0 = 15,000 - 29,999, 7.5 = 30,000 - 39,999

10.0 = >40,000 , Corridor project., TV = 10

Prioritization for CMS Projects within TIPs

Congestion Management System¹²

Current vehicle/capacity ratios on the facility or in the area are over capacity - 5 pts.

Current vehicle/capacity ratios on the facility or in the area are at capacity or greater than .85 - 3 pts.

Current vehicle/capacity ratios on the facility or in the area are less than .85 and greater than .65 – 1 pt.

Current vehicle/capacity ratios on the facility or in the area are less than .65 - 0 pts.

SAFETEA-LU

- Section 134(K)(3)

“(3) CONGESTION MANAGEMENT PROCESS.—

Within a metropolitan planning area serving a transportation management area, the transportation planning process under this section shall address congestion management through a process that provides for effective management and operation, based on a **cooperatively developed and implemented metropolitan-wide strategy**, of new and existing transportation facilities eligible for funding under this title and chapter 53 of title 49 **through the use of travel demand reduction and operational management strategies**.

- The Secretary shall establish an appropriate **phase-in schedule for compliance with the requirements of this section but no sooner than 1 year** after the identification of a transportation management area.

SAFETEA-LU

- NONATTAINMENT AREAS.—
- “(1) IN GENERAL.—Notwithstanding any other provisions of this title or chapter 53 of title 49, for transportation management areas classified as nonattainment for ozone or carbon monoxide pursuant to the Clean Air Act, **Federal funds may not be advanced in such area for any highway project that will result in a significant increase in the carrying capacity for single-occupant vehicles unless the project is addressed through a congestion management process.**

SAFETEA-LU

- Section 134 (i)(2)(D)

“(D) OPERATIONAL AND MANAGEMENT STRATEGIES.—Operational and management strategies to improve the performance of existing transportation facilities to relieve vehicular congestion and maximize the safety and mobility of people and goods.

Issues

- How is the CMS used to effect the decisionmaking process?
- Are local traffic operations agencies included in the CMS process?
- How are CMS projects prioritized or combined with the Plan & TIP?
- How often is the CMS reevaluated?

SUMMARY

- Traffic congestion will not go away
- CMS requirement remains
- CMS's still need time to mature
- Operational strategies show early promise